

Lithium Release Experiments in the Thermosphere

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Neutral wind in the thermosphere is one of the key parameters to understand the ionosphere-thermosphere coupling process. JAXA/ISAS launched successfully S-520-23 and S-520-26 sounding rockets from Kagoshima Space Center (KSC) on September 2, 2007 and January 12, 2012, respectively. The rocket experiments are called WINDs (Wind measurement for Ionized and Neutral atmospheric Dynamics study) Campaign. The purpose is to investigate the momentum transfer between neutral atmosphere and plasma in the thermosphere and ionospheric E and F-regions. The rocket has installed Lithium Ejection System (LES) as well as instruments for plasma drift velocity, plasma density and temperature and electric and magnetic fields. The atomic Lithium gases were released at altitudes between 150km and 300km in the evening for S-520-23 and at altitude of ~100km in the morning for S-520-26. The Lithium atoms were scattering sunlight by resonance scattering with wavelength of 670nm. The neutral winds and atmospheric gravity waves in the thermosphere were estimated from the movements of Lithium clouds observed by CCD imagers on ground. From the diffusion of Lithium clouds, we estimated neutral density and temperature in the thermosphere. In this presentation, we will include the initial results of Lithium release experiments in Kwajalein EVEX campaign by US-Japan collaborating rocket experiments.

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